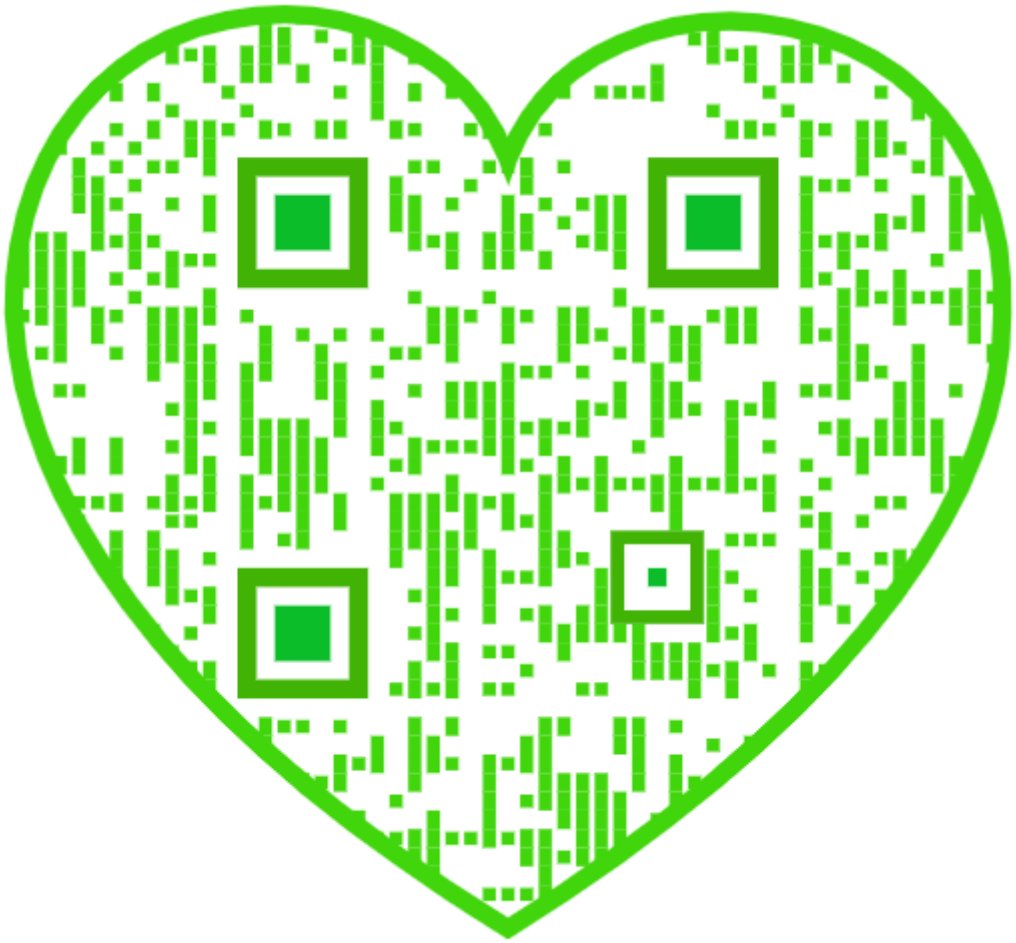


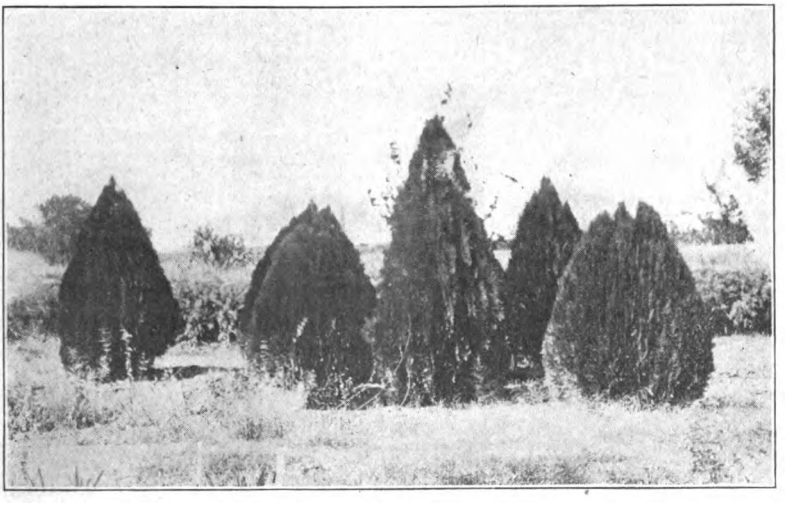
BULLETIN NO. 47

JUNE 1903

New Mexico College of Agriculture and Mechanic Arts

AGRICULTURAL EXPERIMENT STATION

MESILLA PARK, N. M.



A Six-year-old group of Arborvitæs, N. Mex. Expt. Station.

SHADE TREES AND OTHER ORNAMENTALS

By FABIÁN GARCÍA

SANTA FE, N. M.
NEW MEXICAN PRINTING COMPANY
1903.

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NEW MEXICO AGRICULTURAL EXPERIMENT STATION

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The Bulletins of this Station will be mailed free to Citizens of New Mexico who are interested in the work done here, and to others as far as the editions printed will allow.

*Resigned, April 1, 1903.

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SHADE TREES AND OTHER ORNAMENTALS

By Fabián García.

INTRODUCTION

The planting of shade trees and shrubs in New Mexico in the towns and country is done only on a very small scale. One cannot help but be impressed with the scarcity of shade trees either along drives and roads, or in the home grounds. Planting shade trees should be done more extensively throughout the Territory. More interest should be taken in this important subject. While a shade tree, growing beside a drive or in the home grounds, is not generally a source of income to the individual or comunity, if it is properly placed and trained, it may be a thing of beauty and comfort. I am sure that all of us appreciate the beautiful and enjoy comfort. Think of how much a collection or a group of trees, when properly placed, adds to the general surrounding of a place. Why have there been so few trees generally planted throughout the Territory? There must be a reason for this state of affairs, and the following answer may be applicable to this question.

The early settlers cared little for such ornaments. The later wave of immigration from the East was largely composed of settlers transitory in their habits. This was a population largely of persons who were seeking fortunes, with little or no intention of remaining here permanently, and their efforts were turned in a different direction than that of home making. Aside from these causes it has been somewhat difficult in the past to get trees, except the cottonwood, for planting. The scarcity of water for irrigating trees has also had more or less to do in preventing the planting of shade trees.

The lack of information regarding shade trees as well as shrubs and evergreens has been constantly realized, and as a contribution to our knowledge on the subject, the following

list of trees, shrubs, etc. is given. The greater number of these has been tried at the Experiment Station, and a few of them can be found growing in the vicinity. Most of them are well adapted to our climate, but there are some that have not been successfully grown. Nearly all have been introduced from other states.

HINTS ABOUT PLANTING AND CARE OF TREES

While the planting of a tree is a simple operation and most people have an idea as to how to do it, yet it seems advisable to point out a few of the more important things to keep in mind in the planting and training of the young tree.

Soil. Success with shade trees depends in a measure on the soil. If the land is too sandy or gravelly, so as to be deficient in plant food or be subjected to droughts, it is important to make a large sized hole and put in a load of good loam. On the other hand, if the soil is too heavy an adobe, it is also advisable to dig a large hole and break through the adobe soil or in some way loosen it, and put in the bottom of the hole good loam and mix with this the adobe soil. In any event have a soft foundation for the roots to penetrate. If the land is not too sandy or too adobe, the hole need not be so large but always make it of sufficient size to take in all the roots of the tree without crowding them. The size of the hole depends on the kind of soil and on the size of the tree. If the soil is in proper condition and the tree is four to six feet tall with a normal amount of roots, a hole twenty inches in every direction should be large enough.

Planting the Tree. Having dug the hole properly, care should be taken in setting the tree to have the roots spread out as naturally as possible. Do not have the roots all in a bunch. Use a fine soil, at least, next to the roots. It is well to pack the soil firmly, especially if the soil is dry and the tree is not likely to be irrigated just as soon as it is planted. Before setting the tree in the hole, all broken and dead roots should be removed. Plant the tree about one or

two inches deeper than it grew in the nursery. This is done for the reason that after the trees have been irrigated the soil tends to settle.

Irrigation. Water is probably the most important factor in the success of growing trees. Most of the failures in starting shade trees seem to be due to the insufficient amount of water the trees get. Immediately after the tree is planted it should be thoroughly watered or irrigated, especially if the soil is dry. In about twelve to fifteen days the trees should be irrigated again and in about a week thereafter, or as soon as the soil begins to dry, it is well to go over the trees and pack the soil around them, which tends to crack open. The subsequent irrigations should be frequent, at least, till the tree becomes well established. This is especially important in the case of the Cottonwood and other poplars.

Time to Transplant. The planting of trees should always be while they are dormant, or just as they are beginning to grow in the spring. In other words, shade trees can be transplanted any time during the winter but in this climate the months of February and March are preferable.

Size of Trees to Plant. Most people like to plant large trees, i. e. trees five or seven years old; trees that have made ten to twelve feet or more of growth. Such trees can be successfully planted if care is taken to dig them with a good supply of roots. However, a two or three years old tree is preferable. The shock of transplanting is less severe on small trees than it is on large ones.

Heeling-In. This is simply the temporary covering of the roots of the tree to keep them from drying after they are dug, until they are planted permanently. Trees that are bought away and shipped in, usually have to be heeled in for a few days. Some care is necessary in the heeling of trees. Since the trees are usually heeled in at an angle there is some danger of air spaces being left between the trees and the lower wall of the trench. If air spaces are left, the roots are liable to dry up before the trees are set out.

Digging. In digging up trees care should be taken to take

up a large amount of roots in order to support the tree. It may be given as a rule that the more the roots, the better the condition for the tree to grow. Do not allow the roots to be exposed to the dry air too long; protect them as soon as possible after digging the trees.

A Few General Points in Pruning. While pruning is necessary to secure the effect desired, it should be avoided as much as possible. If young trees are pruned from the time they are set out, there will be little or no need of removing large limbs later in the life of the tree. The growth of buds that may develop into undesirable branches can be checked by pinching them off.

Trees are pruned to give them forms that are desirable for some particular purpose. Trees for lawns or windbreaks may be better when they have a low trunk and branches quite low down. On the other hand, shade trees should have a high crown or head and a bare trunk, six to eight feet is a good height.

Dried or dead limbs can be removed at any time in the year. The pruning of large branches during the growing season is not to be recommended as such an operation reduces the leaf surface, and this is likely to check the growth of the tree to some extent. As a rule the best time to prune is in the late winter just before the growth starts. At this time the pruning, especially of large branches, is most safely done. Frequently the pruning of trees is done without having any reason for it. Do not cut limbs unless a definite object is to be accomplished.

Fig. 1. Improperly started young Honey Locust tree, N. M. Expt. Station.

duces them to make too much growth at the top for the amount made by the trunk, and thus a top heavy tree may result (see fig. 1) which is more liable to be broken by the wind. To avoid this uneveness of growth in young shade trees, one should only remove a part of the lower branches and shorten back the remaining ones which can be entirely removed later. By allowing a few shortened branches to grow along the trunk of the young trees during the summer (see fig. 2), the plant food is more evenly distributed along the trunk and top of the tree, i. e., the trunk grows as well as the top, without materially in-

A most common mistake made in pruning young trees is the removal of all the branches along the stem to the head. The pruning of all of these branches along the trunk of the young trees in-

Fig. 2. Properly started, N. M. Expt. Station.

creasing the size of these side branches which can be removed later without injury to the tree. The pruning of young trees the first few years of their growth should be with the object in view of increasing the size of the trunk as well as the size of the top. If the trunk is entirely destitute of any branches the tree is liable to grow too much to top.

Where limbs rub together one of them should be taken off. The head of street trees, especially, should start about six or more feet high. It is quite noticeable in this locality that the Russian Mulberry, which is planted somewhat extensively as a shade tree, and which tends to branch low down, has been trained too low. This method of pruning is not desirable for street trees. Every kind of tree has its own natural form and habits of growth. In pruning different kinds of trees it is not well to try to make all of them the same shape or form. It is a good idea to study the natural tendency of growth of each kind of tree and encourage the natural form. For example, the Box Elder has a more or less spreading, somewhat roundish head and it would not be desirable to prune it to make it grow tall and narrow, while on the other hand, the Carolina Poplar is tall and narrow and it would be somewhat difficult to prune it to make it spread.

Cutting Back Young Trees. It is a common practice to cut back the small trees when they are set out. This operation induces them to branch out. The height at which to cut back the young trees depends on the size of the tree and also on the object for which the tree is being grown.

Topping Old Trees. This practice can only be recommended when it is judiciously done and the operator has some definite object in view to be accomplished by the operation. There is no doubt that the injudicious topping of old trees is frequently the cause of many of them dying. In this locality, the common method of topping old trees is to cut all the branches right down to the main stem of the tree, leaving the trunk with many large scars exposed to the action of our dry spring winds. These scars remain exposed to the wind and sun until the new growth begins to shade the top. Some-

times the scars will crack quite deeply into the wood and occasionally the tree dies.

If topping is to be done, it is believed that a less severe treatment will produce more satisfactory results. The practice in this locality of topping trees which are in a vigorous

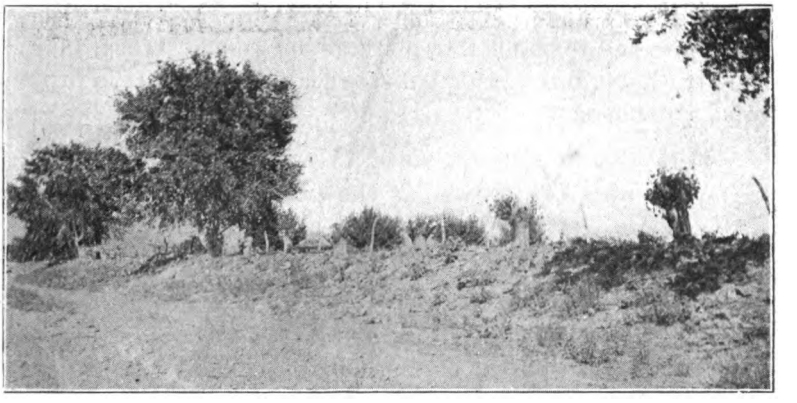


Fig. 3. Showing how severely shade trees are frequently topped in this locality. The two trees to the left were not topped.

condition is not necessary and should not be done. Topping, however, is helpful for old trees when the crown limbs are dying or show signs of unhealthy growth. When the root system has been reduced (as sometimes big roots have to be removed) topping is beneficial as it balances the activities of the tree.

TREES.

Ailanthus (*Ailanthus glandulosa*, Desf.)

This tree commonly known as the "Tree of Heaven," is a fairly rapid growing tree. It does well in our climate and seems to grow well on any kind of soil. It is quite common along the streets of Las Cruces. For street planting it is recommended to plant the pistilate or female trees, as the male tree is said to exhale a disagreeable odor. It is propagated from seed.

Almond (*Prunus Amygdalus*, Baill)

The almond grows as well as the peach tree. In the case of the seedling bitter almond good shade trees may be had, but as a rule the almond is short lived.

Apricots (*Prunus Armeniaca*, Linn.)

It may seem strange in this case to see the apricot classed with the shade trees. The native or seedling apricots are hardy and grow in any kind of soil, and by training them high, they make very desirable shade trees for yards, especially. Plant the seed where the trees are to grow.

Ash (*Fraxinus spp.*)

It is believed that many of the *Fraxinus* will grow here; they are, however, slow growers. There is a native species *Fraxinus velutina*, Torr. that grows to be thirty or more feet high, and very hardy, but it is a slow grower.

Fraxinus lancolata, Borkh. This green ash grows well, but it too, is a slow grower. It is doing very well in the Station plantation. A good way is to get small trees from a nursery and plant them out.

Box Elder (*Acer Negundo*, Linn.)

his is a large sized tree, of rapid growth, with a roundish head, and producing a dense shade. This tree is well adapted for planting here, since it is hardy and easily propagated. It is one of the earliest to leaf out in the spring and one of the first to shed its leaves in the fall.

California Pepper Tree. *(Schinus molle,* Linn.*)*

This is a semi-tropical evergreen tree, with a rounded outline and pendulous branches. In California it seems to be one of the most extensively cultivated ornamental trees. This tree is not grown in New Mexico and from present indications, it seems to be too tender for our winters. In the summer of 1901 seeds of the Pepper Tree were planted in an old discarded cold frame.

The seedlings that came up made a growth of five to seven inches during the season. The small seedlings which were partially protected with a thin canvas, stood the winter quite well; only a few of them being winter killed.

In the spring of 1902 these small trees started out very vigorously, and some of them made a growth of seven feet in height and one inch in diameter at the base, during the season. The vigorous succulent growth did not mature thoroughly before fall. During the winter of 1902-3, some of the largest Pepper Trees were covered all over with a wagon cover, and the rest were left uncovered. About the first of April, 1903 the trees were examined; it was found that all but two had been entirely winter killed. By the first of June the two trees that were only killed back to the ground had made a growth of about five inches. It is doubtful if the Pepper Tree will prove hardy enough to withstand our winters.

Catalpa (*Catalpa speciosa*, Warder)

This tree has large showy foliage and flowers and is a

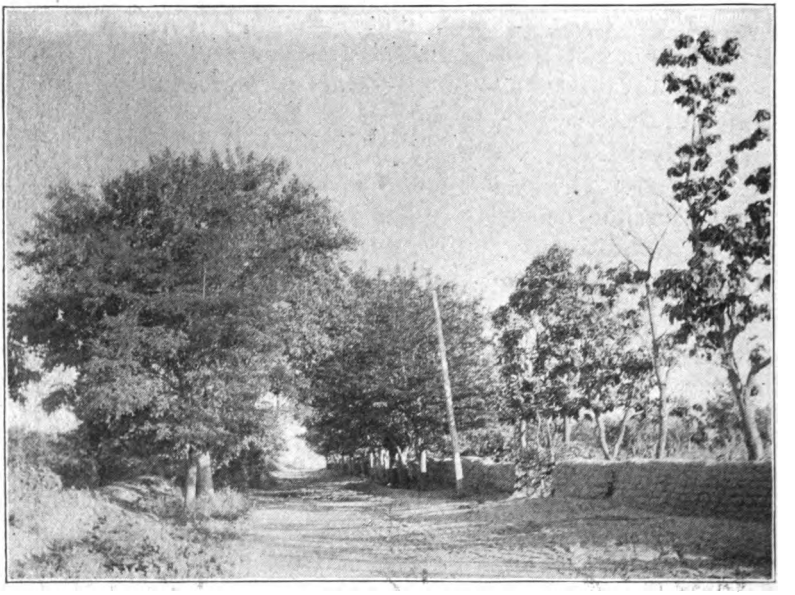


Fig. 4. Avenue of Cotton Woods, Honey Locust, and Catalpa in Las Cruces. The Catalpas (to the right) are dying.

rapid grower. It usually grows vigorously during the first few years when it begins to decline. In the Mesilla Valley it has been shown to be of no value. A few years ago the Catalpa was planted quite extensively in this locality, and while the trees grew fairly well at first, most of them are now dead. The tree seems to be a poor drouth resister. It is possible that in other sections of the territory where a permanent and continuous supply of water can be had for irrigation, the Catalpa may grow well. It is well, however, especially if large numbers of trees are to be planted, to experiment first with a few specimens to see if the Catalpa is adapted to the particular section.

At the Experiment Station it has been observed lately that some of the trees have a sort of a root-gall.

China Berry Tree *(Melia Azedarach,* Linn)

This is a vigorous and large growing tree. Many specimens can be found in this locality that are over thirty feet in height. It resists drought well, has a roundish spreading head and casts a dense shade. Its abundant cymes of flowers are very fragrant in the spring.

Fig. 5. Very old China Berry Trees in front of Casad's place in Mesilla. They are great drought resisting trees.

The one bad feature of this tree is the large crop of berries which drop off during the winter and spring. On the whole, the China Berry Tree is a good shade tree. It is

propagated from seeds which are somewhat slow to germinate.

Var. *umbraculiformis*, Hort. This is the Texas Umbrella Tree. It is a striking tree, and in leaf, bloom, and fruit resembles the China Berry Tree. It has a low roundish um-

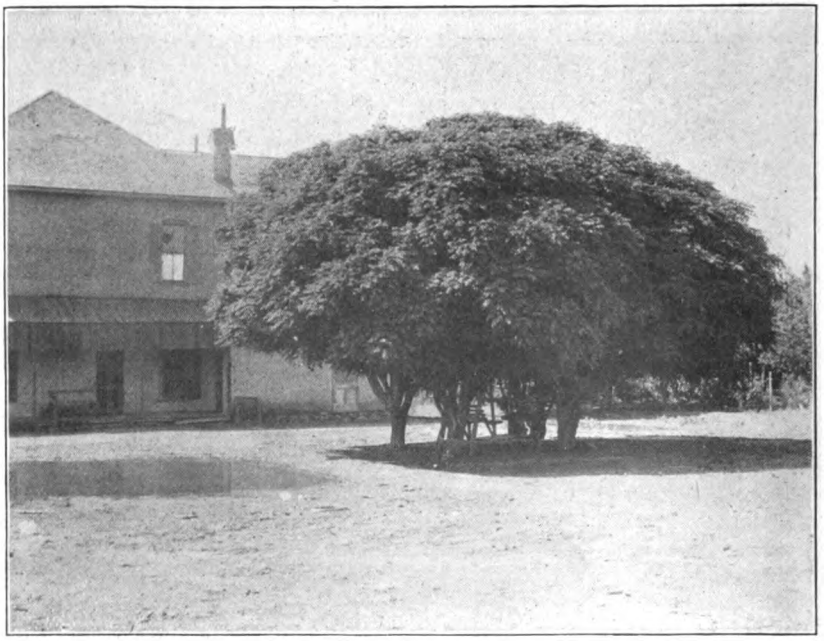


Fig. 6. Texas Umbrella Trees at the Woodland place in Mesilla.

brella-shaped head with a dense foliage. This tree is medium in size, hardy and withstands drouth well. It has been quite extensively planted in this section. While the Umbrella Tree is attractive, it has the undesirable feature of splitting easily by the winds. This is a serious fault, and one that cannot be overcome easily. Usually the tree begins to split when three or four years old. Due to this bad feature, its popularity is liable to decrease. It is propagated from seed.

Cotton-Wood (*Populus Fremontii Wislizeni*, Wats.)

This is the tree that is most extensively planted in New Mexico. It is native in our valleys, and many places have dense "bosques" or forests of it. It grows large and rapidly. There are trees in this locality that measure 10½ feet in circumference. It is a good tree for planting, except that many times it is difficult to get started, as it requires a great deal of water, and this is frequently not at our command. Many times people are disappointed in this tree. These trees start vigorously the same spring they are planted; and the second or third year, especially, if a limited supply of water is applied, a large per cent. of them are likely to die. If the Cotton-wood can be well established it makes a good sized tree. In planting this tree, plant the staminate or male trees, if possible, as the pistilate trees are *very* objectionable on account of the cotton of the seed pods. The trees are easily propagated from seed or cuttings. If the soil is moist and the water is not too deep beneath the surface, the Cotton-wood is very easily started from cuttings. The writer was much interested this spring, while at Carlsbad and Roswell, in the easy and satisfactory way people have of starting the Cotton-wood there. The common way adopted at these places, is to take good sized limbs and soak them for a while and then plant them out.

Elder (*Sambucus Mexicana*, Presl.)

The Elder, while not a large tree, can be trained to become a fairly respectable one. It is desirable, however, for plant-

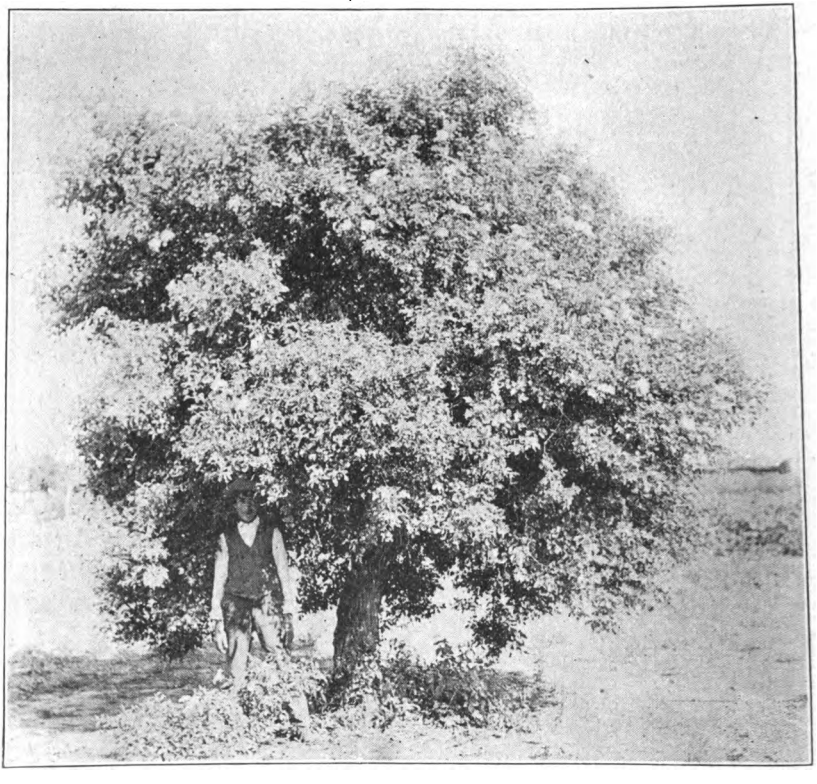


Fig. 7. Elder Tree, an excellent low growing tree in this Valley.

ing in single specimens or in groups. This introduced species grows to the height of fifteen feet, and makes a very compact and roundish head, casting a dense shade. It sheds its leaves late in the fall and leafs out very early in the spring. It grows somewhat slowly and thrives in almost any soil and stands drouth well. The Elder has usually a peculiar crooked and knotted trunk. It can be propagated by cuttings or

sprouts. It has been more or less of a favorite among the Mexicans of this locality. In many of the Mexican yards large specimens of it can be found growing.

Elm (*Ulmus Americana*, Linn.)

The Elm is a desirable tree for planting. This species has done well in the Station plantation. The American Elm is a medium fast growing tree. It does not require the amount of water to establish it as does the cotton-wood. It grows tall with long thin leaders, becoming more or less top-heavy the first few years of its growth, especially if it grows vigorously. The Elm is usually long lived and is propagated from seed, but the average person can do better if he buys his trees from some nursery.

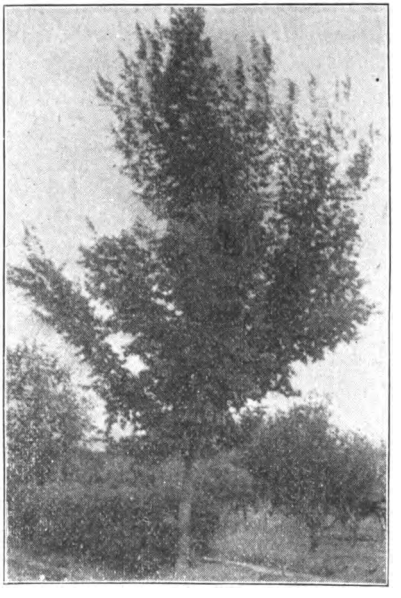


Fig. 8. Elm tree at the N. M. Expt. Station.

Eucalypts (*Eucalyptus spp.*)

Much has been said about growing the Eucalyptus tree in New Mexico. In order to ascertain if the Eucalyptus could be grown, at least in the warmer valleys of the territory, the Experiment Station obtained in February 1902 from the Richman and Mills nursery, Fullerton, California, a number of seedlings of the *Eucalyptus rostrata*, *E. corynocalyx*, *E. rubosta*, and *E. globulus*. All of these seedlings were kept in the green house till later in the season. On May 22, 1902, *E. corynocalyx* and *rostrata* were set out in the field. The other two species were not set out, as they were about all dead.

The Eucapypts planted out made a good growth during the season. Specimens of the *E rostrata* grew three feet in height. In the fall a few of the trees were covered with straw and dirt to protect them from the cold. The winter was not severe. Besides the winter being somewhat mild, it rained considerably. In the spring of 1903 the Eucalypts were examined and it was found that all the unprotected trees had been winter killed to the ground, and some had been killed entirely. The ones that had been protected during the winter were killed back to about two to three inches of the surface. A new and vigorous growth had started from the stumps of these trees. At this time, June 10th, the *E. rostrata* has made a growth of twelve inches.

With the limited amount of data on this subject, nothing definite can be said in regard to the adaptability of the hardier species of the Eucalyptus in southern New Mexico. More kinds have been set out this spring. The species now planted in the plantation are *E. rostrata*, *E. corynocalyx*, *E. rudis*, and *E. polyanthema*. These are some of the species recommended by Prof. Alfred J. McClathie, as being more likely to grow in the valleys of Southern New Mexico.

Flowering Willow (*Chilopsis linearis*, Sweet.)

Two varieties, the purple and white, have been introduced. They grow to be medium sized trees and somewhat thin foliaged. The purple is the quicker and larger growing variety. These willows are grown principally for their flowers.

Kentucky Coffee Tree (*Gymnocladus Canadensis*, Lam.)

This is a good tree that is growing quite well in the plantation and promises to be a good one for this climate. The tree has a more or less rough and scaly bark and large compound leaves, with large and long stem. The leaves have the appearance of small branches and in the fall, when they drop, the trunks of the small trees have very noticeable scars on the bark, which indicate where the large leaf stems were attached. This tree can be propagated by seed. Trees that

were started from seed three years ago on the station farm are now five feet tall.

Locust, Black (*Robinia pseudacacia*, Linn.)

Next to the cotton wood, this is the tree generally planted by the average New Mexican. It is one of the best trees for southern and central New Mexico, as it withstands drouth remarkably well, grows rapidly with an upright form, and is attractive in flower in the spring. To give an idea as to how fast this tree grows in this climate, the following figures have been taken from trees now growing in the Station forestry plantation. The plantation has a number of different kinds of trees planted in the spring of 1899 from yearling seedlings. And with the exception of being cultivated for two seasons they have been allowed to grow naturally, i. e., they have not been pruned or relieved of any suckers. The height of the highest trees in this plantation, now (Dec. 1902) is twnenty-two feet and they measure in circumference eighteen inches. This tree sprouts badly when the roots are injured by plowing. The Black Locust is probably among the best general pur-

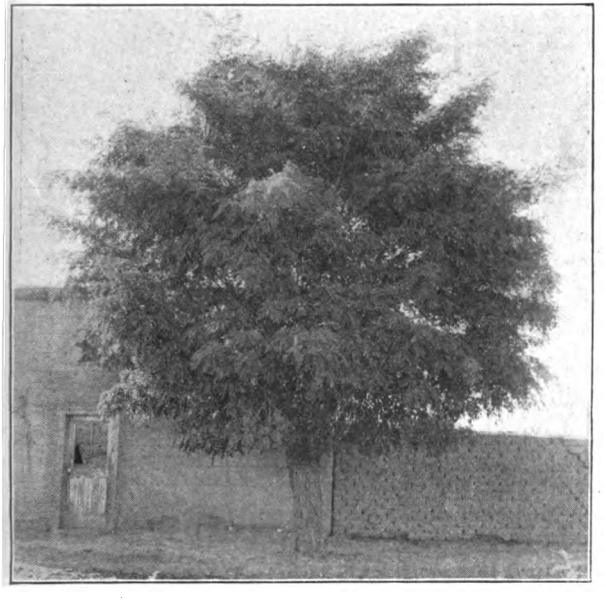


Fig. 9. Black Locust growing in the streets of Mesilla. One of our best trees.

pose shade trees and the most popular in the Mesilla Valley.

Locust, Honey (*Gleditschia triacanthos*, Linn.)

This tree is well adadpted to our conditions, being hardy

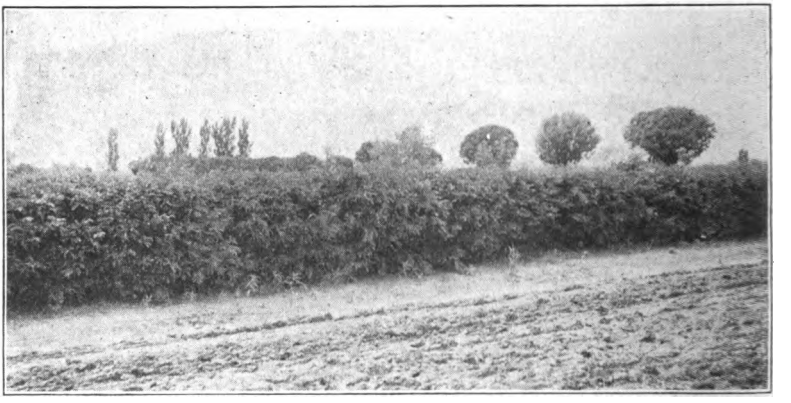


Fig. 10. Honey Locust hedge at the N. Mex. Expt. Station.

and able to withstand drought well. But owing to the fact that it grows so slowly it is not so desirable for general planting as the Black Locust. Good ornamental hedges can be made of this tree. Both of the locusts can be easily propagated by seed but the seed is somewhat slow in germinating.

Mulberry, Russian (*Morus alba Tatarica*, Loudon.)

This is a most valuable tree for this section and ranks along with the best trees tried. It is very hardy, withstanding drought remarkably well. It is almost as rapid a grower as the Black Locust, makes a more attractive and roundish head when properly trimmed, and gives a more dense shade. In

order for it to make a good tall shade tree, it needs to be trained high, since, if allowed to grow naturally, it will make too low a head. The first few years of its growth it tends to sprout considerably all along the stem. The main objectionable feature for planting it along walks or in front yards, is the fruit. This obstacle can be easily overcome, however, by planting staminate trees which may be propagated from cuttings of male trees. The fruit is of no commercial value, as it is very insipid. Birds are very fond of the fruit, and a windbreak of the bearing trees around orchards would serve a double purpose. The bearing variety can also be planted to advantage where the fruit can be eaten by chickens. The Mulberry makes good screens or windbreaks, and it should be more used for this purpose than it is. The trees can be propagated by seeds, cuttings, layers or grafting. On the whole, it is one of the best and most desirable trees for this region. The leaves are well adapted for feeding silk worms.

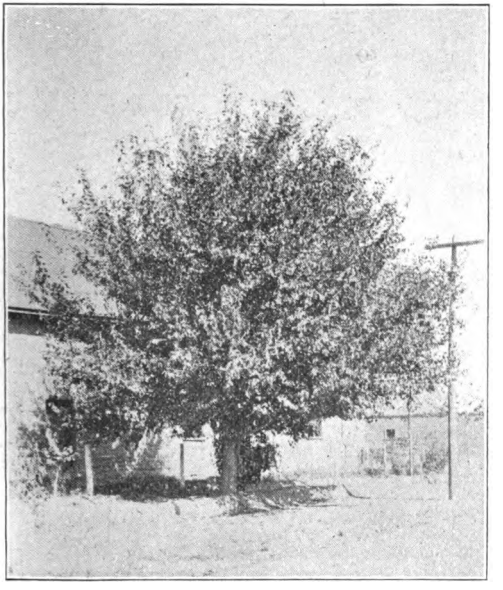


Fig. 11. A well shaped Russian Mulberry but started too low down, N. Mex. Expt. Station.

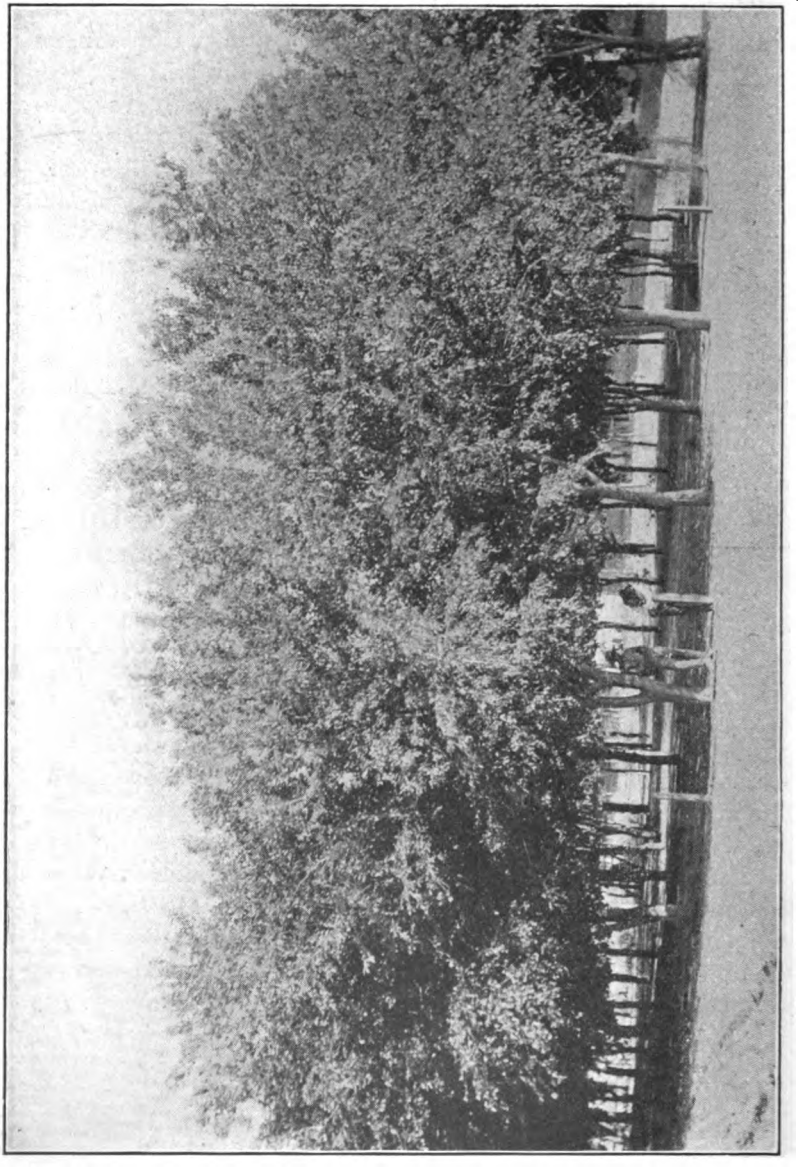


Fig 12. Russian Mulberries in the Plaza of Mesilla. These trees have not been irrigated for about ten years.

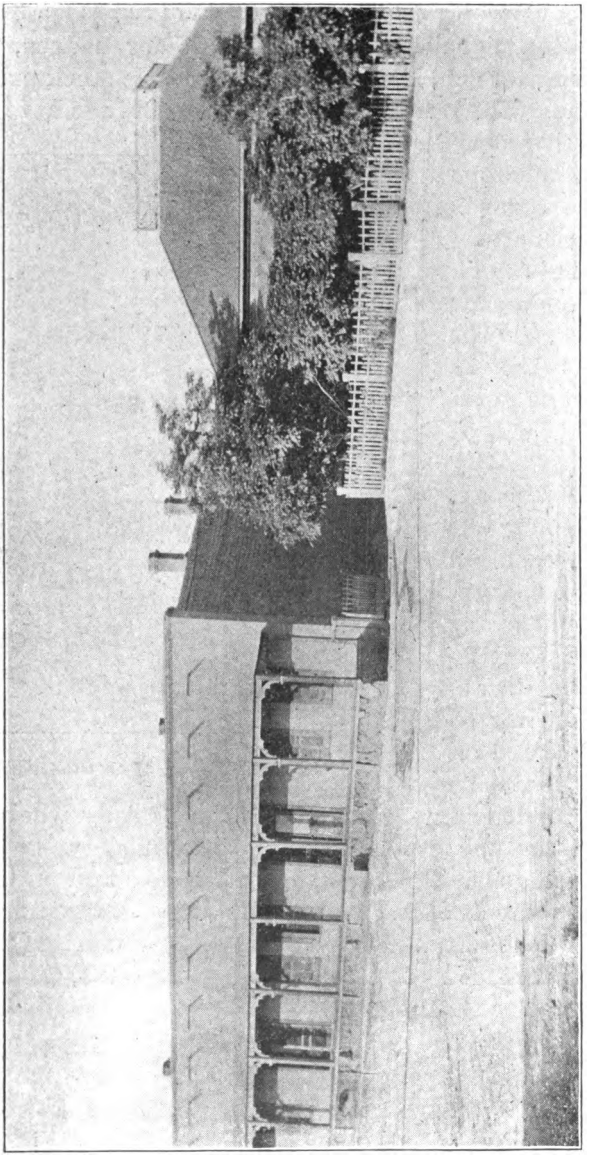


Figure 13. Above irrigation level in Las Cruces, Trees improve the appearance of a place. These trees are watered from a well by means of a hose.

Osage Orange (*Toxylon pomiferum*, Linn) (*Maclura aurantiaca*, Nutt.)

The most popular use for this plant is for hedges, as it makes a hedge which, if properly trimmed, is stock proof in a short time. Many hedges of the Osage Orange have been planted in this locality with satisfactory results as regards its defensive nature. However, it is not a desirable hedge for small places, since it is such a voracious feeder that it soon depletes the soil of much of its fertility for some feet away, so that nothing but grass and weeds will grow. The Osage, while it is not a very desirable plant to have around on account of being so thorny and hard on the soil, should be adopted to some extent as shade trees, especially where it is difficult to start the less hardy kinds. Its moderately large, glossy, green dense foliage is very attractive and in this respect excels the Locust. As a shade tree it is giving good results in this locality. For planting along the drives where there is a likelihood of stock skinning the trees, the Osage can be planted to advantage.

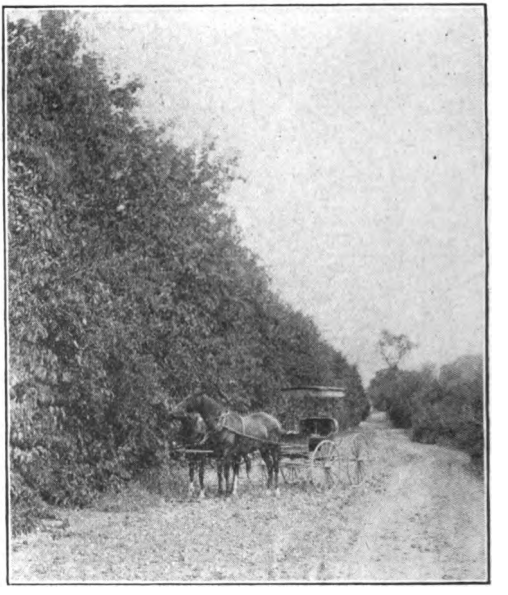


Fig. 14. An old hedge of Osage Orange at Mesilla.

Pear (*Pyrus communis*, Linn.)

Like the apricot the native or seedling pears make good

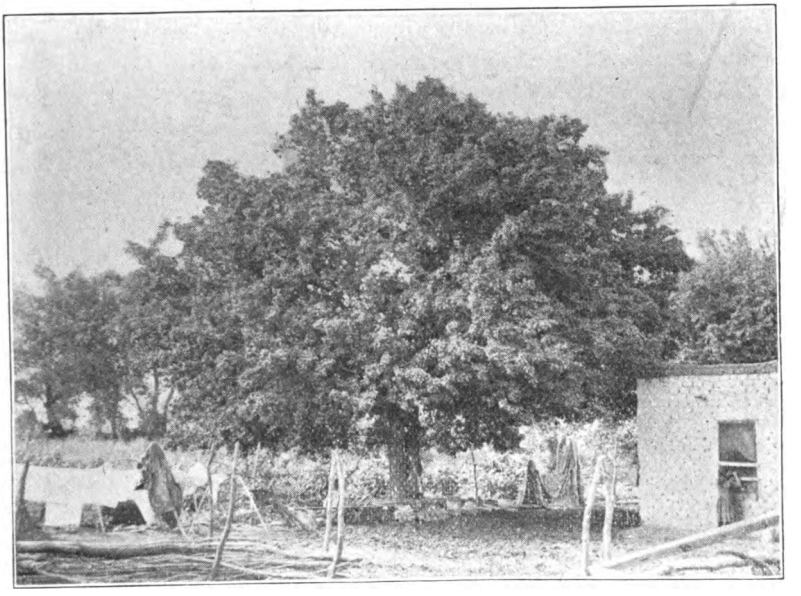


Fig. 15. Native pear used as a shade tree in a Mexican country home near Las Cruces.

shade trees. They are hardy, attractive and longed lived. These are propagated from seed. Many of these seedling pear trees can be found growing in some of the Mexican home grounds where they attain a height of twenty-five feet or more.

Poplars (*Populus spp.*)

Both the Lombardy and Carolina can be grown here; they grow very fast and for quick results they are desirable, but of course they are not good trees for shade as they grow too narrow and tall. They require abundance of moisture to grow well and generally speaking, they are short lived. They can be grown to advantage as a nurse tree with the slower and longer lived kinds. They are very easily propagated from cuttings.

The Carolina is somewhat pyramidal and casts more shade than the Lombardy, which is very narrow and formal. In this connection, Prof. Bailey has the following to say of the Lomabardy, and in a measure it may be applicable to the Carolina as well: "For shade it has little merit, and for timber none. People like it because it is striking and this, in an artistic sense, is its gravest fault." "The Lombardy should rarely, if ever, be seen as a single specimen; and above all its formality and stiffness should not be emphasized by planting it in rows along country roads."

Populus alba, Linn., which is commonly known as the Silver or White poplar, is a tree more or less pyramidal in growth and has a whitish bark and the leaves are wooly on the under surface. It seems to be short lived. Trees of this kind at the Station have not given satisfaction. However, a few of them growing in a yard near the Station on a loose sandy soil, are doing well.

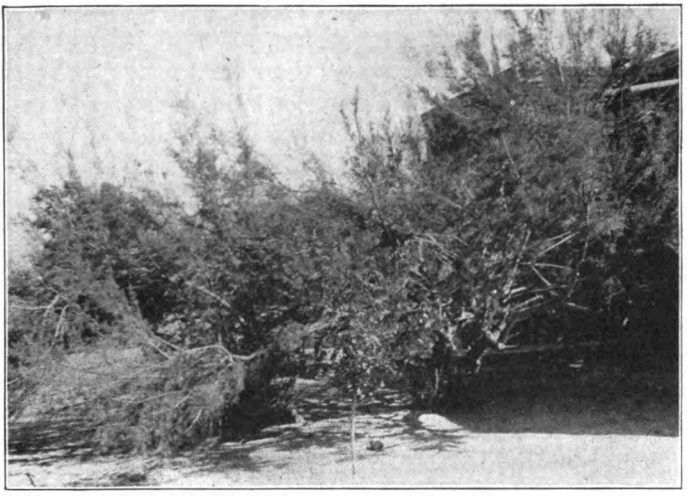
Purple Leaf Plum (*Prunus Pissardi*, Hort.)

This tree does well here, and while it does not grow large enough to be planted as a shade tree, it is a very desirable small ornamental tree. The wood and leaves are dark purple, and so is the fruit from the time it sets until it ripens.

Salt Cedar (*Tamarix Amurensis*, Hort.)

This shrub or tree is perfectly hardy and withstands drouth remarkably well. After it has been started, it often grows without irrigation. It is a rapid grower, and its bluish green cedar-like foliage gives it a graceful appearance. This "cedar" is well adapted and can be used for hedges. It is a difficult matter to get it to grow as a tree, but it can be done by presistent trimming. The branches bend down as though they were top heavy. In Albuquerque, N. M., there are many hedges and some trees of the Tamarix. This plant seems to be especially adapted for planting in places where

only a small amount of water can be had. It will take care of itself, provided it has been given a good start. It is easily propagated from cuttings.



Nig. 16. Screen of Salt Cedar in a back yard at Mesilla Park growing with very little water.

Soft Maple (*Acer saccharinum*, Linn.)

The soft maple has given poor results in the Station plantation. The new growth which is quite tender and succulent gets killed back during the winter. In East Las Vegas the Soft Maple is also giving poor satisfaction. It appears that the trees begin first to turn white or light color in the leaves and as this progresses the limbs begin to die at the end and finally the entire branch is dead. In this way all the limbs gradually die and often the body of the tree cracks open.

Sycamore (*Platanus occidentalis*, Linn.)

While this is a large and vigorously growing tree in many places where it grows well, so far the results with it at the Station have not been very satisfactory. Two attempts have been made to grow the Sycamore. The first trees planted

grew two seasons, making only a small growth, and then died. The second lot is growing slowly.

Walnuts (*Juglans spp.*)

The trees of some of the small hard shelled black walnuts do admirably in this climate. They seem to be very hardy, withstanding more dry weather than most other trees, growing moderately fast and making good shade trees. They can be propagated by planting the nuts. Two kinds of these walnuts are growing in the Station orchard.

The English Soft Shell walnut has not given satisfactory results. It seems that the new growth does not ripen enough before the winter comes and most of it is killed back. A tree that the writer knew of in the Casad orchard a few years ago never bore, and did not grow over eight or ten feet, though it was over ten years of age; most of the new growth of this tree was killed back every year.

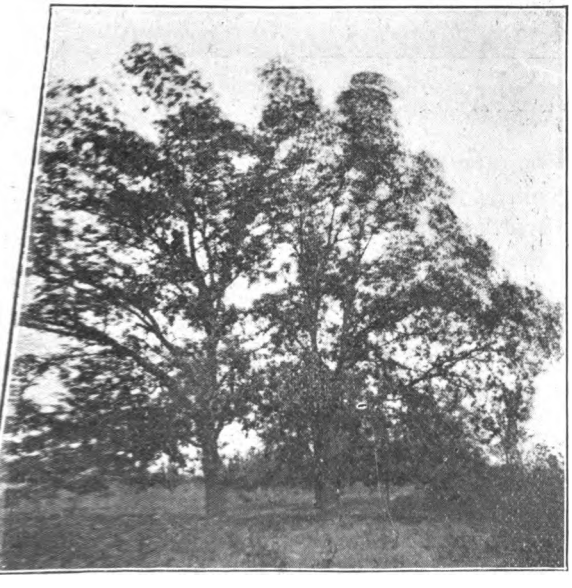


Fig. 17. Pecan Trees in bearing at Mesilla.

The pecans, however, are hardy and do very well here, but they grow slowly. Very large trees which bear profusely are now growing in this vicinity. The trees are propagated from seed. The nuts should be placed where the trees are to grow, as it is a difficult thing to transplant successfully a pecan tree on account of its long tap root and the lack of secondary roots.

Wild Olive or Russian Oleaster (*Elaeagnus angustifolia, Linn.*)

This is a Russian tree, and grows to be of medium size. While it is moderately slow in growth, it has given satisfactory results at the station. It is hardy and withstands drought well. It grows with a rounded head, and has narrow leaves which are silvery white underneath. The blooms which appear in May are yellowish and have a pleasing fragrance; but to some people the fragrance is sickening. In some sections of the West and in Russia, the Wild Olive is used as a hedge plant. It is propagated by means of seeds. Prof. N. E. Hansen says: *"This form is generally known as the Russian Wild Olive, although Russian Oleaster would be a more exact name. It is allied to the Buffalo berry and does not belong to the olive family."

Willows. (*Salix spp.*)

While the willows grow well and sometimes attain large size, they are not desirable as shade trees.

*South Dakota Sta. Bull. No. 72.

EVERGREENS

A few years ago, the idea prevailed in this region that evergreens would not grow here. It has been demostrated at the Station that many kinds do admirably and it is believed that a much large number of kinds will grow successfully. The following is a list of those evergreens tried at the Station.

Arborvitaes (*Thuja occidentalis*, Linn.)

There are many varieties of Arborvitaes and most of them are excellent for small places, either in groups or as single specimens and also for hedges. A few of these varieties were planted at the Station the spring of 1896, and some of them are now ten feet high. The *Pyramidalis*, which is pyramidal in form, is compact and the most rapid growing and largest of the varieties tested. The *Elegantissimo* is a less compact variety and lighter in color, becoming quite yellowish along the edges of the leaves during the earlier part of the summer. The variety commonly known as the "Golden" is one of the most elegant and popular. It is medium in growth and somewhat pyramidal and very compact in form. The beautiful golden tint

Fig. 18. A seven year old "Golden" Arborvitae, which measures 12 feet high and 7 feet through at base, N. Mex. Expt. Station.

that the foliage assumes during the summer makes this variety very attractive and desirable. A Chinese variety is very compact and almost spherical in form and somewhat dwarf in habit of growth.

The Arborvitae can be propagated by both seeds and cuttings. The cutting method is slow and somewhat uncertain, as the cuttings are hard to root. The seed method is easiest and best, but the seedlings are likely to vary. They will grow well on a soil that is quite poor and require very little cultivation. All the treatment given to the Arborvitaes growing on the Station grounds has been to keep the weeds down and the ground moist. Irrigating them is the main feature to keep in mind. They will stand a great deal of water in our soil. Frequent irrigations should be given, especially during the spring and early summer, at the time when they are growing more rapidly.

In planting coniferous evergreens small specimens, about twelve to eighteen inches high, should be secured. This sized trees are preferable to the larger ones because they are easier to transplant and a much larger per cent. will grow. It is a difficult matter to get the large specimens to grow, especially when these have been shipped a long distance. Many people do not like to plant the small trees because it takes them so long to grow to an appreciable size, so they send away for trees three or more feet in height, only to be disappointed in most cases by their dying. In transplanting coniferous evergreens much greater care than with deciduous trees is required. They should be transplanted with as much earth on the roots as possible, so as to keep the small roots from drying out during the operation. The most important feature in the operation is not to allow the roots to become dry; the sap in the roots thickens and will not resume its natural state, and the result is that the tree is likely to die. The best time to transplant these trees seems to be in the spring just about the time the growth is starting. After the small evergreens are transplanted, they must be irrigated

and it is a good plan, though not necessary, to partially shade them with boards from the southern sun.

Box Tree (*Buxus spp.*)

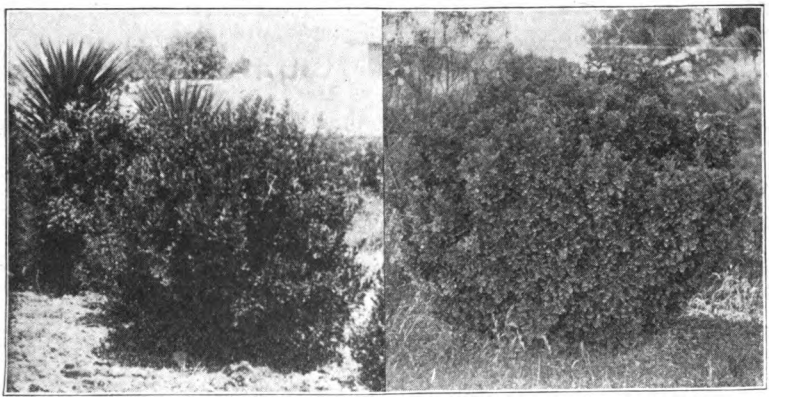
Varities of this evergreen are doing well here. The Box Tree thrives in our climate and soil. It is a small and quite ornamental bush and it grows very slowly. It is extensively planted for hedges and edging in other states. Seedling trees planted at the Station in 1896 are now 2 1-2 feet high. They can be propagated by cuttings or division, but the former method is more preferable.

Burning Bush or Spindle Tree (*Euonymus spp.*)

The *Euonymus* is a very interesting and desirable evergreen shrub. It thrives well in this climate, is a much larger and more rapid grower than the *Buxus* and the color of the foliage changes but very little in the winter. It is very desirable for planting either in groups or as single specimens, and for ornamental hedges it would make a valuable plant. While the growth is compact and the lower branches are well developed there is a tendency to send out straight leaders which have to be cut back in order to keep its outline regular. The three kinds at this Station are growing well.

The *Euonymus Japonicus*, Linn. is the most rapid grower of the the three (see fig. 20) and has a roundish outline, with green foilage.

The *Euonymus Japonicus medio-pictus*, Hort. is also a rapid and compact grower, with yellow branches and leaves blotched yellow in the center. This is a very ornamental shrub, and a hedge of it would be most attractive, see fig. 19.



Figs. 19. Fig. 20,
Burning Bush or Euonymus showing compact growth, very desirable evergreens for ornamental hedges, N. Mex. Expt. Station.

Euonymus Japonicus argenteo-variegatus, Rgh. is a medium and moderately loose, upright grower with silvery variegated leaves. It is not as large as either of the other varieties. The *Euonymus* is easily propagated from cuttings and the treatment of the small plants out in the garden is the same as for the Arborvitae.

Himalaya Cedar (*Cedrus deodora, Loudon*)

This tree is commonly known as the Himalaya Cedar from the fact that it grows naturally on the Himalaya mountains, where it reaches a height of 150 feet and is of a pyramidal form. The silvery green foliage with the semi-weeping habit of the branches makes it a very graceful and beautiful tree. It is doing admirably at this Station; it grows more rapidly than the other evergreens, and its color changes but very little during the winter. A seedling tree transplanted in the spring of 1898 has grown from a small twelve inch seedling to a tree that is about ten feet in height. This is a most promising evergreen for this section.

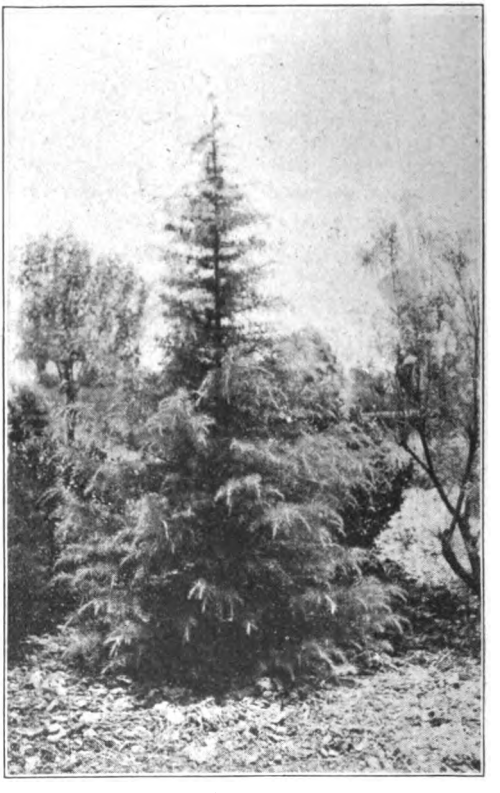


Fig. 21. A Himalaya Cedar (True Cedar) growing at the Expt. Station.

The *Cedrus Atlantica* has given very unsatisfactory results. The directions given for the Arborvitae in regard to the propagation, cultivation, etc., are applicable to the *Cedrus*. Trees of this genus are true Cedars, while the trees usually called Cedars are really Junipers.

Japanese Arborvitae or Japanese Cypress (*Retinispora plumosa*, Beissn. & Hochst.)

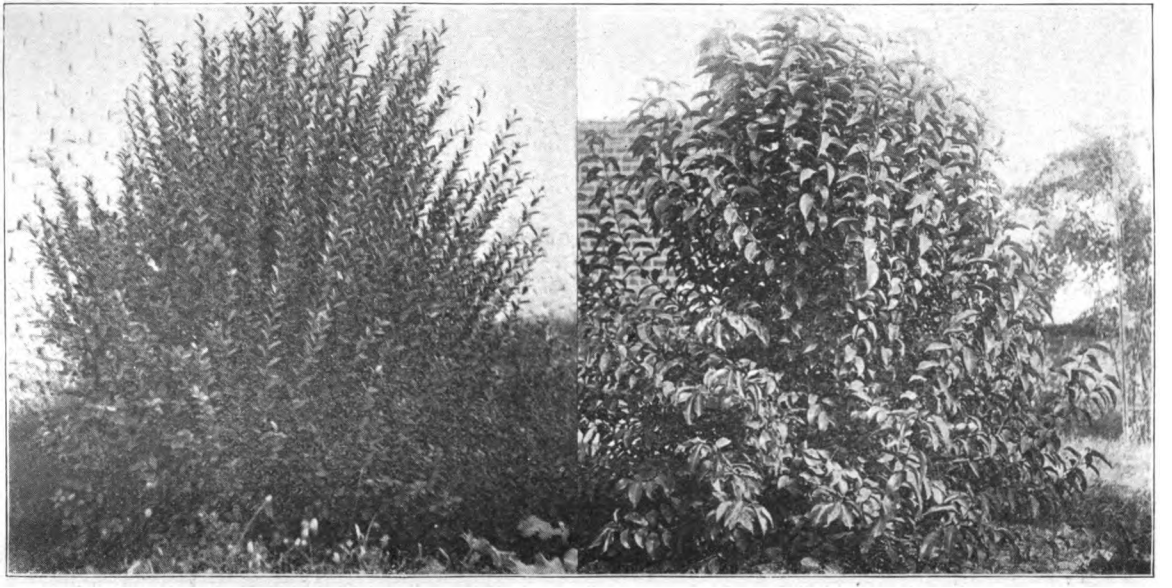
Fig. 22. Japanese arborvitae, a very attractive little evergreen, N. Mex., Expt. Station.

This is a dwarf, compact and somewhat spherical little tree, and with its silvery green foliage in the summer and its purplish tint in the winter, it is very ornamental. It is perfectly hardy here. An idea can be had of its dwarf habits of growth by saying that the specimens planted in the ornamental grounds in 1896 have made a growth of three feet in diameter and four and one-half feet in height.

Privets (*Ligustrum spp.*)

Ligustrum ovalifolium, Hassk. which is commonly known as California Privet is upright and slightly pyramidal in habit, with medium sized (2 to 3 inches) somewhat elliptical, dark green leaves. The leaves are thickly set on the stem, making the internodes short; during the winter the green foliage turns to a purplish hue which is very attractive. This shrub is perfectly hardy and may reach ten or more feet in height. It can be propagated by cuttings. The California Privet is well adapted and used extensively for hedges in the states where it grows well. It is also very ornamental when planted in groups or as single specimens. This shrub should be more generally planted in southern New Mexico.

Ligustrum Japonicum, Thunb. or Japan Privet grows



Figs. 23. California Fig. 24. Japan

Two species of Privets, showing arrangement and size of leaves, N. Mex. Expt. Station.

about the same as the preceeding species, but with more spreading branches. It has glossy, green leathery, and larger leaves, about three to four inches long. The leaves are not so thickly set as in the California Privet. The tip ends of the leaves may be injured by our frosts during the winter. It is also a good hedge plant and is well adapted for planting for ornamental purposes, but in this locality it is not considered so desirable as the other species. Both of these Ligustrums may drop their leaves during some of our more severe winters, especially if the plants are not kept well irrigated. They can be propagated from cuttings.

Red Cedar or Red Juniper (*Juniperus Virginiana*, Linn.)

The Red Cedar may grow to be one hundred or more feet high in other states. It has quite a dense pyramidal head and well developed branches right from the ground. This tree produces a berry-like fruit which is purplish in color and covered by a thick whitish bloom.

Fig. 25. Red Cedar (true Juniper) at the Expt. Station, showing well developed lower branches.

The trees on the Station grounds which were planted in 1898 are growing very vigorously, showing that the Red Cedar is well adapted to this climate. It is a handsome and a very desirable tree for planting, and one that should be more generally used in ornamental grounds. It can be propagated by cuttings, but the more common way is by planting the seeds.

SHRUBS.

Althea (*Althaea spp.*)

This shrub which is commonly known as the Rose of Sharon, is hardy and grows from four to six feet high. It blooms very freely during the summer. The flowers are usually produced on the current year's growth, and the more vigorous the growth the better it blooms. The shrubs are usually cut back or trimmed in the early spring. The Althea requires a great deal of water to do well. It can be propagated from cuttings.

Artemesia (*Artemesia Abrotanum*, Linn.)

This is a native of Europe and Russia and is a medium sized growing shrub. It has been used as a hedge plant in Canada. It begins to grow early in the spring and with its feathery foliage it is quite attractive in the early part of the summer. After the blooms dry up it assumes a dull green color. The branches are killed back every winter. It is easily propagated from cuttings. On the whole it is not a desirable shrub to plant here.

Barberry (*Berberis Spp.*)

Species of the barberry seem to succeed in this climate. These are low and ornamdntal shrubs, many of which are spiny.

Berberis vulgaris, Linn. as well as the purple leaved variety have done well at the Station.

Bird of Paradise (*Caesalpinia Gilliesii*, Wall.)

This shrub is well adapted to this climate. (See N. M. Station Bulletin No. 40.)

Bladder Sena (*Colutea media*, Willd.)

This is a vigorous and hardy deciduous shrub. In two years it has made a growth of five feet and is somewhat spreading in habit. Its orange or reddish yellow pea-like blossoms are very abundant in the early spring, and the shrubs continue blooming, but in a less degree, during the

season. The inflated and many-seeded pods are quite decorative. The *Colutea* may be propagated either by seeds or hard wood cuttings.

Crape Myrtle (*Lagerstroemia Indico*, Linn.)

This is a beautiful little shrub. It blooms freely during the summer, and the fringed flowers make it the more attractive. It grows in this climate, as a rule, as high as three feet. While it is a desirable shrub for planting, it is somewhat tender and unless protected during the winter, the branches are likely to be winter killed down to the ground, but in the spring new and vigorous shoots will sprout, which will bloom abundantly in the summer. There are a number of varieties in cultivation. but only a few have been tried at the Station, the red flowering kind giving the best results. The Crape Myrtle can be propagated by cuttings of the ripe wood.

Fuchsia (*Fuchsia Spp.*)

These small shrubs can be grown for summer use in the garden, but they are too tender to stand our winters. They are better adapted for house culture where they can be kept all the year around. Fuchsias can be propagated from seeds and cuttings of half matured wood.

Japan Quince (*Cydonia Japonica*, Pers. *Pyrus Japonica*, Thunbg.)

This is a small shrub with spreading and somewhat spiny branches, glossy leaves, and attractive, scarlet quince-like blooms. It is perfectly hardy and is well adapted for borders, shrubbery, and low hedges. It is propagated from seeds and cuttings.

Lantana (*Lantana Camara*, Linn.)

This plant does well during the summer. It is a dwarf and spreading bush. Its free blooming habit and its large number of cymes of flowers add to its desirability for planting in the garden. The most serious drawback to the Lantana in this climate is that it is not hardy enough to stand our

winters. This necessitates planting new plants every spring. The old plants can be taken up in the fall and put away indoors during the winter and in the spring they can be planted out again. It is readily propagated by soft wood cuttings.

Lemon Verbena (*Lippia citriodora*, Kunth.)

This is a popular shrub in many places for planting in the garden as it has very fragrant foliage, sprays of which can be used in mixed bouquets. It does well here. The branches which sprout from the crown make a growth of about four feet in height. This new growth is, as a rule, partially or wholly winter killed, but will start again very vigorously in the spring. A good way to propagate the Lemon Verbena is by division, i. e. by cutting a piece of the root away with a crown bud or eye.

Lilac (*Syringa vulgaris*. Linn.)

There are a number of varieties of the Syringa Vulgaris in cultivation. It is a popular and ornamental flowering shrub. The purple and white are the two varieties generally planted. Both are early bloomers, and the fragrant panicles of blooms mixed in and towering above the glossy foliage, makes the lilac a very desirable shrub for spring. The white variety is slightly earlier than the purple and sometimes the blooms and buds develop too early and are killed by our late spring frosts. On the whole the purple variety is the more satisfactory of the two. The bushes of these varieties are usually compact and grow from four to six feet in height. The lilac can be propagated from seeds, green and hard wood cuttings and also by division and grafting. It produces its blooms on the previous year's wood and so care should be taken in pruning it. It should be pruned soon after blooming. If pruned at any other time many of the flower buds will be destroyed.

Oleander (*Nerium Oleander*. Linn.)

While the Oleander is a well known evergreen shrub and extensively cultivated in the warmer countries, it is not hardy enough to stand our winters. It is better adapted and largely

used for house culture in large pots or tubs. It is particularly liable to the attack of the Oleander scale and mealy bug.

Plumbago (*Plumbago Capensis*, Thunb.)

This is more or less of a climbing, straggling, semi-upright shrub. The blue and white are two varieties used at the Station and both of these grow well in the summer and bloom profusely, but like the Lantana, they are easily killed. The old plants should be thoroughly protected or taken indoors during the winter.

Scarlet Sage (*Salvia splendens*, Ker-Gawl.)

This is a flowering shrub that is fairly well adapted to this climate. The flowers which are borne in terminal racemes are scarlet in color. The plant is of an upright habit, and the specimens growing at this Station grow two or three feet high. Frequently they are partially or wholly killed back in the winter. In the spring new and vigorous branches start from the ground. The Scarlet Sage can be propagated either by seeds or cuttings.

Siberian Pea Tree (*Caragana arborescens*, Lams.)

This makes a hardy and very ornamental plant in the spring here. It can be used as a hedge or for planting in gardens, and will grow to be a small tree. In Russia, it is said to grow about fifteen feet in height. The locust-like foliage which is of a light green and appears early in the spring, and the yellow-pea-like blooms are desirable features in this small tree. It is easily propagated from cuttings, and does not kill back in the winter.

Spireas (*Spiraea spp.*)

Many species of the spireas succeed in this climate. They are very ornamental deciduous shrubs and very desirable for planting in borders, masses, or single specimens where medium sized plants are desired.

Spiraea Van Houttei, Zabel. has succeeded on the Station farm. It is an early and heavy bloomer and is a splendid kind for planting.

Spiraea prunifolia, Sieb. & Zucc. has done fairly well. It is a most graceful shrub with slender upright branches, which bend over in the early spring when they are full of the small clusters of pure white flowers. It blooms early and appears to be slightly less hardy than the former species.

Spiraea cantoniensis, Lou. *S. Reevesiana*, Lindl. has a straggling and upright habit. The branches reach from four to six feet in height. The specimens at the Station hold the leaves well during the winter. It has not bloomed as profusely as the two former species.

Spiraea Billardii, Hort. (See Station Bulletin No. 40.)

These spireas should not be pruned very much. Thin out and remove all the weak and old branches. These plants can be propagated by seeds or hard or green wood cuttings.

VINES.

Asparagus, Ornamental (*Asparagus Sprengeri*, Regel.)

While we may grow this plant out in the open during the summer, it is altogether adapted and extensively grown for house use. It is a very popular and decorative plant. The leaves are glossy, green, narrow and flat, while the branches are long, drooping and branched. It is of easy culture, propagation is done by division or by seeds.

Asparagus plumosus, Baker, like the last named species is used for house culture and in growth, in some respects, resembles the garden asparagus, except that it is a slower grower, and its foliage is finer and the branches are flatter and spread out horizontally in delicate sprays. It is a most decorative and desirable plant for house use. The leaf sprays or strands will keep fresh for a number of days after being cut.

Chinese Wisteria (*Wisteria Chinensis*, DC.)

This is a good hardy climber. It is a rapid grower, twining around any support it may have, has a pale green foliage, and large drooping clusters of purplish pea-shaped flowers. The Wisteria is difficult to propagate from cuttings as they

do not root easily. A very good way to propagate the plant is by layering.

Clematis. (*Clematis paniculata.* Thunb.)

For a detailed discussion of this species, which has been introduced, see Station Bulletin No. 40.

Honey Suckle (*Lonicera spp.*)

Species of this plant succeed in this region. The evergreen and climbing kinds are very desirable, especially as they are well adapted for covering walls and trellis work.

Lonicera Japonica, Thunb. is a vigorous climbing evergreen vine with white and yellow flowers on the same stem sometimes changing to purplish, outside. These blossoms are very fragrant. It blooms early in the spring and continues blooming most of the summer. This is a most desirable vine and very extensively planted in this locality.

Lonicera Chinensis, Wats. is closely related to the preceeding species; it is an evergreen with very similar flowers and smaller foliage, but is not quite so vigorous a grower as the japan form.

Lonicera Tatarica, Linn. belongs to the shrub honeysuckles and grows and blooms well here. Its leaves appear very early in the spring. Sometimes during the later part of the summer the edges of the leaves become brown as though they were attacked by blight.

Lonicera Tatarica virgindalis grandiflora, Hort., is also a bush honeysuckle and is proving to be just as hardy as the *Lonicera Tatarica*, but it is prettier and more showy when it is in bloom early in the spring. The flowers which are quite large, have striped and marble pink and white petals. The berries are quite large and bright red in color.

Other forms of the bush honeysuckle have just been planted in the Station arboretum, but as yet no data has been gathered as to their adaptability to this climate. The honeysuckle can be easily propagated by layers or hardwood cuttings. The cuttings of the Japan form root very easily.

Japanese Fern Ball.

This is a house plant and has been much advertised and pictured extensively in the florists' catalogues. While it succeeds in the moist sections, it is unsatisfactory in this dry climate. The balls started in the Station greenhouse have been a failure.

Hop Vine (*Humulus Lupulus*, Linn.)

The hop plant probably ranks first as a rapid grower among the climbing plants that may be used here. It makes a growth of twenty or more feet during one season and has a dense rough foliage. The hop root is perennial, but the growth is herbaceous and is winter killed to the ground; in the spring shoots grow from the crown. The hop vine is well adapted for covering walls and unsightly objects. It is propagated from seeds and from cuttings.

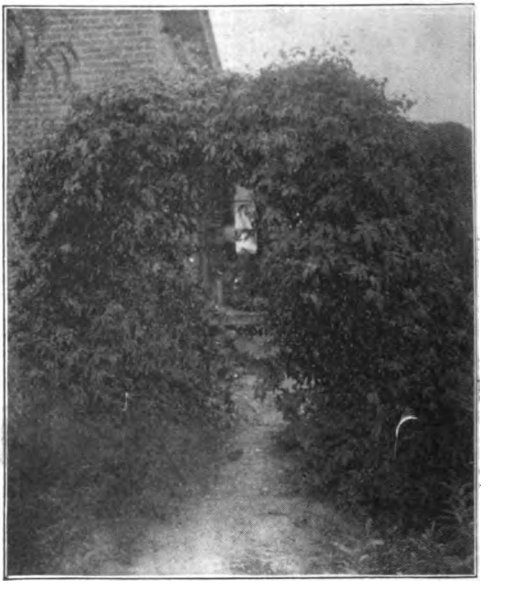


Fig. 26. One season's growth of Hop Vine at Messila Park.

Madeira Vine (*Boussingaultia baselloides*, H. B. K.)

This vine comes from perennial tuber-like roots which sprout vigorously in the spring and grow during the season, if conditions are favorable, as high as twenty or more feet. Its somewhat fleshy, light green, and medium sized leaves, and abundance of small, delicately fragrant flowers during the summer and fall, and its easy culture are features that

make the Madeira Vine very desirable. The vine itself is winter killed every year down to the root. The tubers can be left out in the open till spring, and then they can be divided and planted out. This is a good way of propagating the vine.

Roses, Climbing *(Rosa spp.)*

Few forms of the climbing roses have been tried, but they grow and bloom well.

Fig. 27. Crimson Rambler set out in the spring of 1899, N. M. Expt Station.

The *Crimson Rambler* has succeeded admirably at the Station and it blooms profusely in the spring. It is a rapid grower, frequently the new sprouts make a growth of eight or ten feet in one season. The flowers are produced on semi-pyramidal panicles, each containing a large number of the blooms. The individual blooms are small, about one inch in diameter, and crimson in color. It blooms only once a year and this in the spring. It is an excellent rose for verandas and arbors and other trellises.

The White and Yellow Ramblers are very similar to the Crimson Rambler except in color, and while these have not been tested at the Station, they will probably succeed here.

Madam Plantier is a climbing rose, but not so vigorous a grower as the Crimson Rambler. The white blooms are produced in clusters and are larger than the crimson rose blooms. It is an excellent rose for trellis work.

The *Lamarque* is also a climbing rose, it grows well and blooms profusely. The blooms are white, some of them having a yellowish tint. This being of the ever-blooming group, is very desirable for planting.

Silk Vine (*Periploca Graeca*, Linn.)

The Silk Vine is a deciduous and twinging plant, and succeeds admirably in this climate; it should be extensively planted as it is of easy culture and is a rapid grower, reaching sometimes to a height of fifteen to twenty feet in one season. The blooms which are produced in clusters, are small and purple in color and of secondary importance. The foliage is the attractive feature. The leaves are long, narrow, glossy and dark green. The Silk Vine is easily propagated from layers, but more commonly from cuttings.

Trumpet Flower or Trumpet Creeper (*Bignonia Tweediana*, Linn.)

This is a climbing vine. It grows and blooms well. It has large tubular reddish orange flowers, and is an excellent vine for covering walls to which it clings without any artificial support. It can be propagated from cuttings.

Vinca or Periwinkle (*Vinca minor*, Linn.]

This is a hardy running or trailing vine. It stands drought quite well, its large glossy leaves keep green during the winter, and its large, blue, funnel-form blooms are out early in the spring. It is a good plant for borders, and for use in rock work or small mounds. It can be propagated by cuttings or division, and also by layers. The runners can be allowed to root and in the spring they can be severed from the old plant and set out.

Virginia Creeper [*Ampelopsis* (*Parthenocissus*) *quinquefolia*, Michx.]

This is perfectly hardy and is the most popular deciduous

climbing plant here. It is of a rapid growth and in the fall its foliage assumes a beautiful reddish tint. The Virginia

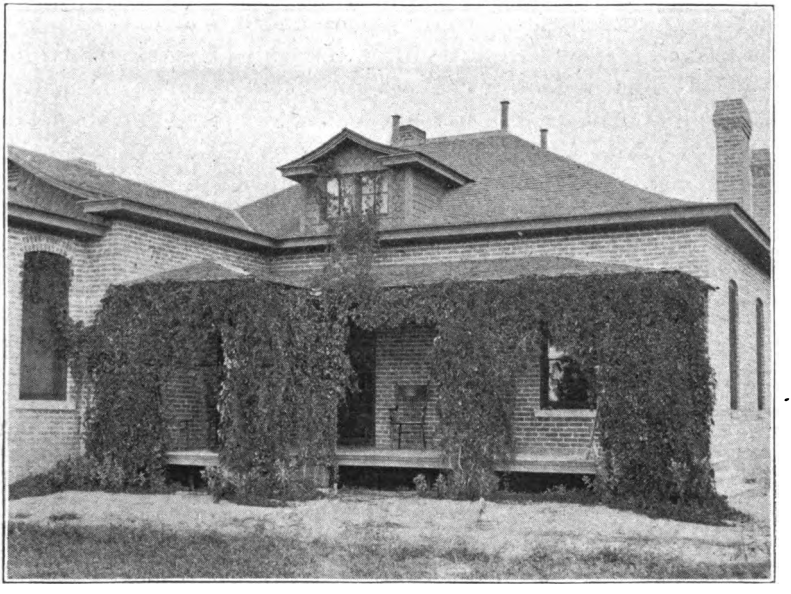


Fig. 28. A good use of the Virginia Creeper at J. E. MacGregor's home, Mesilla Park. Two years after setting out.

Creeper is well adapted for covering walls, verandas, porches, etc. It is easily propagated by cuttings, division or layers.

GRASSES.

Bamboo (*Phyllostachys Henonis*, Mitford.)

The Bamboo has done quite well at the Station. It will stand drought well, and is a slow grower. It is quite ornamental, especially in the winter as it is an evergreen. It can be propagated by dividing the clumps. The Bamboo spreads by an underground stem.

"Carrizo" (*Arundo Donax.* Linn.)

"Carrizo" is the Mexican name for the English Giant Reed, and because it is so common a name in this section, it is used

here. It is a perennial grass, with large and dense green leaves. The "Carrizo" is well adapted to this region. It thrives along the acequia or ditch banks as well as on places where it gets little or no irrigation and it is a good drought resister. It grows rapidly, often the canes make a growth of twelve or more feet in one season. The "Carrizo" is useful as well as ornamental. It is occasionally used for shade in poultry yards and in front of unsightly objects in the back yard, and is well adapted for low windbreaks. In the fall the

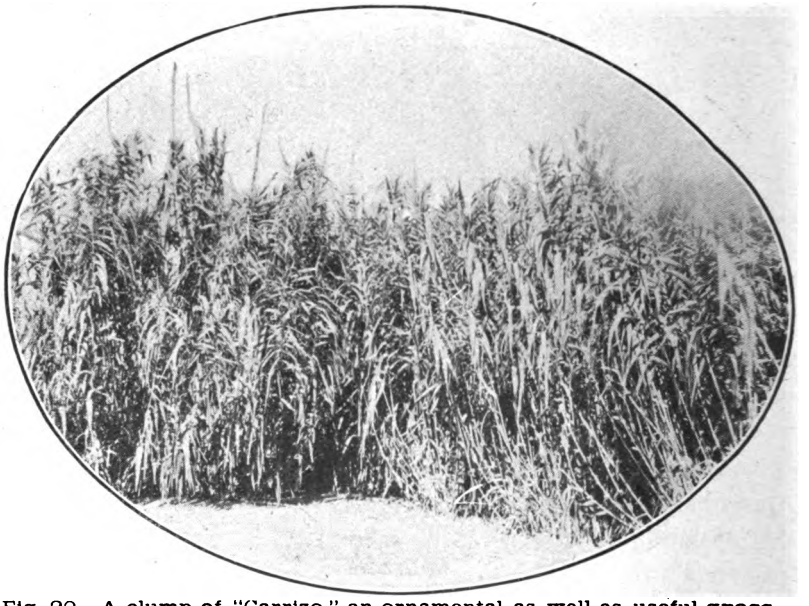


Fig. 29. A clump of "Carrizo," an ornamental as well as useful grass. Grown extensively in this locality.

canes terminate in a large plume, something like the pampas grass. The "Carrizo" is easily propagated by dividing the clumps. The matured canes when laid in a moist place will root. There is also a small native form which may be found growing in low swampy places. Figure 29 shows a windbreak of the "Carrizo" eighteen months after planting. It has had but one irrigation. This plant is very common in this locality. A few years ago the Station obtained a clump of a variegated

form of this plant from Joseph Vestal and son of Little Rock, Ark. This variety is not as rapid nor as large a grower as the common Mexican form.

Eulalia (*Miscanthus Sinensis.* Anders. *Eulalia Japonica.* Trin.)

The variety *Zebrinus* has been very satisfactory at the Station. It is remarkably hardy and an ornamental grass and is well adapted for bedding. The leaves are banded and quite attractive. The bands are light yellow in color. It can be propagated from seed or by division.

Pampas Grass (*Cortaderia argentea*, Stapf. *Gynerium argenteum*, Nees.)

This is a hardy and very ornamental tall plumy grass. The species tried has succeeded well. It responds quickly to good soil and plenty of moisture. This grass is very desirable and most effective in lawn work. It is easily propagated by division or seed. The plants grow as high as five feet.

Yucca (*Yucca aloifolia*, Linn.)

This is an introduced species and while this Yucca grows fairly well on the Station farm, the results are not altogether satisfactory. It has the undesirable habit of breaking off at the surface. The Yucca makes a growth of three to five feet and then it breaks off and will sprout badly. The sprouts will grow three to four feet and they, in turn, break off. It has also been observed that it is more or less subjected to the attack of a fungous growth which appears on the leaves. On the whole it is considered an undesirable Yucca to plant.

A LIST OF GOOD TREES, EVERGREENS, SHRUBS, VINES AND GRASSES.

TREES.

The following list of trees, while not large as compared with the number that may be adapted to this section, may be helpful in the selection of kinds:

Black Locust, Russian Mulberry, Box Elder, China Berry Tree, Elm, Ash, Honey Locust, and the common pear and

apricot seedlings. Where a low headed and dense foliage tree is desired, both the common Elder and Texas Unbrella Tree may be planted. For large and quick growth, where an abundance of water for irrigation can be had or where the water is only a few feet from the surface, the Cotton Woods are good kinds to plant. The Catalpa is considered a poor tree here.

EVERGREENS.

Arborvitaes—The *Pyramidalis* and the "Golden" are the leading varieties. The Japanese form is a good dwarf kind.

Junipers—The "Red Cedar" is the only Juniper that has been tested at the Station.

Cedars—Two species have been tried, the *Cedrus deodora* and *C. Atlantica.* The former species is the best.

Euonymus—Of these shrubs the *E. Japonicus* and *E. Japonicus medio-pictus* are preferable.

Privets—Both the California and Japan forms are very good, but the former is more desirable.

SHRUBS.

Spireas—Both the *Prunifolia* and *Van Houttei* are good shrubs. The latter seems to be more hardy.

Other shrubs are Crape Myrtle, Lemon Verbena, Lilac, Bladder Sena, Bush Honey-Suckle, and Altheas. The Althea requires an abundance of water to do its best. The *Caragana grandiflora* is a good shrub.

VINES.

The Honey Suckle, Madeira Vine, Silk Vine and Virginia Creeper are among the best vines tested. The Crimson and *Lamarque* are two good running roses.

GRASSES.

The "Carrizo" is perfectly hardy and makes a large and quick growth.

Both the *Eulalia Japonica* and Pampas grasses do well and are very ornamental.

ACKNOWLEDGEMENT.

The Cyclopedia of America Horticulture by Prof. L. H. Bailey and the So. Dak. Bulletin No. 72, by Prof. N. E. Hansen have been taken as authorities on the scientific names of the trees, etc., in this bulletin, and they have been freely consulted.

The writer is much indebted to Prof. E. O. Wooton of this Station for valuable suggestions in the preparation of this bulletin, and for the use of photographs of Figs. 5, 14, 17, 22, 26, 27 and 28.

The rest of the illustrations are from photographs taken by the author.

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